CLAIMS

1. An optical information recording medium comprising a substrate, a plurality of information layers provided on the substrate, and an optical separating layer provided between information layer adjacent to each other, in which information is recorded or reproduced by irradiation of a laser beam,

wherein when an information layer that is provided closest to a laser beam incident side of the plurality of information layers is taken as a first information layer and an optical separating layer provided in contact with the first information layer is taken as a first optical separating layer, the first information layer comprises a recording layer that can change between two optically different states, a transmittance adjusting layer that adjusts a transmittance of the first information layer, and a low refractive index layer provided between the transmittance adjusting layer and the first optical separating layer.

2. The optical information recording medium according to claim 1,

wherein when a refractive index of the low refractive index layer with respect to the laser beam is taken as n1, and a refractive index of the first optical separating layer is taken as n4, n1 and n4 satisfy:

$$|n1-n4| \leq 0.5 .$$

3. The optical information recording medium according to claim 2,

wherein n1 and n4 satisfy:

$$|n1-n4| \leq 0.1 .$$

4. The optical separating layer according to claim 1,

wherein the recording layer contained in the first information layer is formed of a material that can change between a crystalline state and an amorphous state, and

when a transmittance of the first information layer with respect to the laser beam when the recording layer is in the crystalline state is taken as Tc1 (%), and a transmittance of the first information layer with respect to the laser beam when the recording layer is in the amorphous state is taken as Ta1 (%), Tc1 and Ta1 satisfy:

$$40 < Tc1 \text{ and } 40 < Ta1 .$$

5. The optical information recording medium to claim 1,

wherein the first information layer further comprises a reflective layer provided between the recording layer and the transmittance adjusting layer,

when a refractive index of the transmittance adjusting layer with respect to the laser beam is taken as n2, an extinction coefficient thereof is taken as k2, a refractive index of the reflective layer with respect to the laser beam is taken as n3, and an extinction coefficient is taken as k3, at least one of the following relationships is satisfied:

$1.0 \leq (n2\text{-}n3) \leq 3.0$ and

$1.0 \leq (k3\text{-}k2) \leq 4.0$.

6. The optical information recording medium according to claim 1,

wherein the low refractive index layer comprises at least one selected from the group consisting of SiO_2, Al_2O_3, LaF_3, $ZrSiO_4$, and ZrO_2.

7. The optical information recording medium according to claim 1,

wherein the low refractive index layer has a film thickness of 1 nm or more and 25 nm or less.

8. A method for manufacturing an optical information recording medium comprising at least a first information layer and a second information layer that are laminated via an optical separating layer, the method comprising:

(a) forming the second information layer,

(b) forming the optical separating layer on the second information layer,

(c) forming the first information layer on the optical separating layer,

wherein the step (c) comprises a step of forming a low refractive index layer on the optical separating layer, a step of forming a transmittance adjusting layer on the low refractive index layer and a step of forming a recording layer.

9. The method for manufacturing the optical information recording medium according to claim 8,

wherein the low refractive index layer and the optical separating

layer are formed such that when a refractive index of the low refractive index layer formed in the step (c) with respect to the laser beam used for recording or reproducing information is taken as n1, and a refractive index of the first optical separating layer is taken as n4, n1 and n4 satisfy:

$$|n1-n4| \leq 0.5 .$$

10. The method for manufacturing the optical information recording medium according to claim 8,

wherein in the step (c), the low refractive index layer is formed of a material comprising at least one selected from the group consisting of SiO_2, Al_2O_3, LaF_3, $ZrSiO_4$, and ZrO_2.

11. The method for manufacturing the optical information recording medium according to claim 8,

wherein in the step (c), the low refractive index layer is formed so as to have a film thickness of 1 nm or more and 25 nm or less.